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MONDAY, JUNE 28, 1858.

JAMES HENTHORN TODD, D. D., President, in the Chair.

DR. LYONS, on the part of the Commission appointed by the Council on March 1st, presented and made some remarks on—

THE REPORT ON THE CASE OF M. GROUX.

THE case of M. Groux, on which we have been instructed to report by the President and Council of the Royal Irish Academy, is an example of bifid sternum, or congenital fissure of that bone, a condition noticed by Meckel, Breschet, Serres, and Geoffrey St. Hilaire. By the two last investigators it has been specially instanced in support of the doctrine of osseous development being conducted in conformity with the laws of "bilateral symmetry," and central conjunction. This bifid sternum, like the bifid spine and the remaining examples of the symmetric category of Serres, depends on the arrest of growth.

When M. Groux's arms are not extended, and the pectoral muscles are relaxed, this depression is an inch in width when measured at the termination of the third rib. The integuments pass into and across this groove, and present no alteration of structure or adhesion; they can be pinched up and drawn outwards in a fold without any indication of the existence of a dense fascia or expansion beneath; into this groove the hollow at the lower portion of the neck is continued, uninterrupted by any bounding osseous line or inter-clavicular ligament; the sternal ends of the clavicles are small; the sternal portions of the sterno-mastoid muscles are not deficient, nor are their sternal tendons, which are inserted into the edges of the bone immediately beneath each clavicle. The groove is closed transversely, and at the lower part by the ensiform cartilage, which is flat, broad, very firm, and overlapped on each side by the sternal ridges, with which it is connected by a strong but elastic medium. This is rendered very evident when M. Groux raises or throws back his arms, or when, having fixed the latter, he puts the pectoral muscles, which are well developed, into strong action: the fissure then becomes expanded to a width of nearly three inches. When, on the contrary, the shoulders are brought forward, the fissure becomes nearly closed, and the clavicles touch and even overlap each other.

Before proceeding to describe the most remarkable feature in this case, namely, the existence of a visibly pulsating tumour in the upper and middle parts of this fissure, we have to observe that there is no evidence, either from symptoms or physical signs, of the existence of any diseased condition of the heart, the great vessels, or the lungs. There is no visible pulsation in the veins of the neck. But a question might arise, namely, whether the organs of circulation might not themselves present some form of congenital malformation or malposition. On this point we have come to the conclusion that evidence of any of these conditions which might be expected in such a case—namely, defect of me-

sial union—does not exist. There is nothing to lead us to suspect that any malformation by defect exists in the heart.

When the subject is in a state of quiescence, the following phenomena can be observed on inspection and examination of the sternal fissure:—

1st. The existence of a pulsating tumour, of an elongated oval shape, of about two inches in length; it crosses the mesial line obliquely, so as to show about two-thirds of its volume to the left.

2nd. The pulsation of this tumour, though plainly visible at a distance, is by no means forcible. It has not the strength of the systole of a healthy heart, nor yet the force of the beat of an aneurism; and it does not convey the sensation of proceeding from a cavity with thick or solid walls.

3rd. The collapse of this tumour is much more sudden than its protrusion. It appears to be second in point of time.

4th. This collapse or disappearance of the tumour is, however, effected with a progressive movement from above downwards. This is rendered obvious by the observer placing three fingers lightly on the pulsating mass. Their successive elevation shows the course of the movements as above stated.

5th. This pulsation was ascertained to be not synchronous with the beat of the apex of the heart, but to precede it by a slight though appreciable interval of time.

6th. The diastolic movement seems to take place in a direction from the left and behind, forwards and to the right.

7th. On applying the finger lightly over this tumour, the pulsation is observed to be single.

8th. On more deep and forcible pressure backwards and slightly to the left side, a double stroke is felt.

9th. On deep pressure backwards in the upper part of the fissure, a distinctly double pulsation can be perceived.

10th. This second pulsation, we submit, is that of the arch of the aorta, of the innominate, or of both.

11th. This pulsation (that of the arch of the aorta) follows, by the shortest appreciable interval, upon that of the heart's apex.

12th. It is also consecutive, but by a more prolonged and sensible interval, to the pulsation of the oval-shaped tumour.

13th. The order of succession of the phenomena here described is well displayed and confirmed by the application of the sphygmoscope.

14th. The heart was examined with the stethoscope in the usual situation, and presented the ordinary first and second sounds, quite devoid of any abnormal character in tone or rhythm.

15th. Auscultation over the seat of the aorta gave the two sounds peculiarly well defined, the second in particular being remarkably clear in this situation.

16th. In no part of the cardiac region, or in the line of the great vessels, was any murmur or other abnormal sign discoverable.

17th. Occasionally the second sound lost its usual definite and single character, and assumed a complex character, approximating to reduplication, and containing at least two elements of sound. This was observed towards the close of the examination, when M. Groux was somewhat fatigued.

The pulsations of the oval tumour were examined with great care, and with the following results:—

At our first examination, when we used an ordinary stethoscope, we were not able to discover any *special* single sound, attending the diastole of the tumour. The ordinary double sounds of the heart were heard, without any departure from their normal character, except that the first sound had a slightly muffled character.

But on our second examination we came to the following conclusions:—

When an observation was made with the flexible stethoscope of M. Groux, the bell being simply placed in apposition with the tumour, and pressure being, as far as possible, avoided, a single sound was evident. This single sound was replaced by a double sound on making even a slight degree of pressure, but its distinctly single character could be reproduced at pleasure by removing the pressure.

Under these circumstances, taking the three points or centres of sound in the fissure, from above downwards, or from below upwards, they might be enumerated as follows:—

Double sound,	} corresponding to	{ Aorta.
Single sound,		
Double sound,		
		{ Left auricle.
		{ Right ventricle.

The succession in point of time is, as before stated, as follows:—

Tumour.
Ventricle.
Aorta.

There is a peculiarity belonging to this sound (of the oval tumour) which, without offering any explanation of it, we think it right to record:—

The first impression it gives is that of a single, complete, and instantaneous sound, somewhat analogous to that observed in aneurisms with a single beat. But, on more careful and delicate analysis of its characters it is found not to be instantaneous, but to rise progressively, though still in the shortest possible interval of time, from a minimum to a maximum, conveying the idea that its cause is a vermicular rather than an instantaneous or perfectly sudden action. This character is found most evident in the very uppermost part of the tumour.

It was observed that the character of this sound (sound of tumour) was not constant: it seemed to have certain periods of a maximum intensity, and again of a minimum; there was a certain relation not easily determinable to the inspiratory or expiratory efforts. A peculiar whiff was occasionally observable, but under what precise conditions did not admit of being defined.

We have studied the enlarged condition of the oval tumour produced by M. Groux, after deep inspiration, followed by suspension of further respiratory effort. It has appeared to us, under this condition, to reach at least three times its ordinary volume: and this circumstance, were there no other, furnishes a strong argument in favour of the opinion that the tumour in question is the right auricle. In the distended state the pulsation becomes feeble, irregular, and fluttering, and apparently more rapid.

18th. By certain respiratory efforts M. Groux can arrest the radical pulse in both wrists.

19th. There is a peculiar condition of the heart's action induced in M. Groux by certain respiratory efforts, which is worthy of notice, though not bearing upon the main question upon which we have been appointed to report. It is the production of a strong pulsation at the left side, and referrible to the body of the heart. To induce this, M. Groux makes use of the following succession of actions. He takes a very deep inspiration, and then, by a long regulated expiratory effort, expels the air from his lungs as far as it appears possible to carry this process. Towards the close of this expiratory effort the pulsation of the heart is felt with great force, and with a kind of struggling motion, in the third, fourth, and fifth intercostal spaces, between the left border of the sternum and a line passing vertically through the left nipple. During this time the stethoscope, placed on the anterior part of the right side of the chest, seemed to indicate a period of apnoea, while a loud muscular murmur, apparently referrible to the action of the intercostals, was heard.

If it be assumed that in this case there is no abnormal condition of the heart or great vessels, we may inquire what is the actual nature of the pulsating tumour.

The possible causes of a pulsation in the sternal region may be enumerated as follows:—

I. The pulsation of the base of the heart itself, and principally of that of the right ventricle.

II. The pulsation of the pulmonary artery.

III. The pulsation of the aorta.

IV. The action of the right auricle.

Against the first hypothesis there is to be urged:—

a. The want of synchronism between this pulsation (that of oval tumour) and the impulse in the left infra-mammary region.

b. The singleness of the pulsation.

c. The direction of the action of the tumour, which is from above downwards.

The following considerations lead us to reject the second supposition:—

1. That this pulsation precedes the stroke of the heart.

2. That it is single, and from above downwards.

3. That a double pulsation or action may be felt on deep pressure

over the tumour.

4. That when M. Groux suspends his respiration, the tumour acquires a volume far beyond what could be supposed to be attainable by the pulmonary artery, even at its origin.

By a similar process of investigation we conclude that it is not produced by the diastole of the aorta. This conclusion is strengthened by the observation that, on making pressure in the inter-clavicular space, the pulsations of the aorta can be felt giving the usual phenomena,—the sphygmoscope also showing the want of synchronism between the beat of the tumour and that of the aorta, the fissure preceding the latter by a distinct interval.

We hence conclude that this remarkable pulsation can be only that of the right auricle. Its general character and appearances coincide remarkably with those which belong to the auricular actions as seen in vivisections; and all its phenomena are explicable on this hypothesis. For the sake of clearness we shall here recapitulate the reasons which lead us to conclude that the oval body is the right auricle.

1st. Its situation, which is neither that of the base of the ventricles nor the arch of the aorta.

2nd. The progressive, or, as it were, vermicular action of the pulsation.

3rd. Its singleness of sound.

4th. The sensation which it conveys of being a cavity with thin walls.

5th. Its remarkable enlargement when respiration is suspended.

6th. Its precedence of the ventricular impulse.

ROBERT HARRISON.

ROBERT LAW.

WILLIAM STOKES.

ROBERT D. LYONS.

Dr. Law said, that, as a member of a profession peculiarly interested in the advancement of the science of Physiology, he felt that he ought to express his obligations to the Academy for the readiness with which it had acceded to the suggestion of appointing a Commission to inquire into the case of M. Groux, which presented so favourable an opportunity of investigating some of the most important phenomena of the circulation and the heart's action. In the conduct of the Academy on this occasion Dr. Law recognised an admission that Physiology had its place amongst those sciences that it was intended to promote, and that it was not its fault that communications upon so important and interesting a science were so rare in the Academy, but rather reflected on those members from whom such communications might have been expected. Dr. Law observed that Physiology was the basis of medicine as a science; that we acquired our knowledge of it by observation and experiment on living animals. Observation taught us the phenomena which bodies

present immediately to our senses, while experiment discovered to us their mode of existence under circumstances contrived by art,—not the result of natural necessity, but the act of one desirous of extending his knowledge. While we observe, we, as it were, watch Nature; when we experiment, we question her. Dr. Law remarked that nature or accident sometimes provided us with experiments on man, whose results were infinitely more satisfactory and more to be relied on than those deduced from the experiments, even the most artfully contrived, when made on inferior animals; that in the latter case the results were only applicable to human physiology when the animals experimented upon stood in very close zoological relation to man; and, therefore, the analogy could never be so complete as when nature or accident made man the subject of experiment. And, again, the sufferings of the animal the subject of experiment often so modified and affected the phenomena, that they could not be regarded as such as Nature would exhibit under less painful influences. M. Groux' case was one of those in which nature afforded us a facility of both seeing and hearing the actions of the heart more plainly than could be done under ordinary circumstances, when the walls of the chest were normally developed. A similar case to that of M. Groux occurred in a female in France, and who suffered as little inconvenience from it as M. Groux seemed to do. There was in her case, as in M. Groux', a deficiency in the sternum, which allowed the heart's action to be seen. She was beyond the age of thirty when she was the subject of observation. She was then in good health, actively engaged in laborious occupations, and had borne children. Dr. Law instanced, as an example of accident in the human subject supplying a most favourable opportunity of extending our physiological knowledge, the case of St. Martin, with whose history every physician was familiar. This man received a gun-shot wound which penetrated the chest and abdomen, wounding both the left lung and the stomach. He ultimately recovered, with a fistulous opening of the stomach, which communicated externally. Luckily for science, he became the servant of a physician, Dr. Beaumont, who knew how to avail himself of this precious opportunity of investigating the actions of the stomach, and of observing the relative digestibility of different substances which constitute our ordinary food, which he did by withdrawing them at various intervals of time, and seeing the time each required for its complete digestion. Dr. Beaumont's observations made on St. Martin furnish us with the fullest information we possess on the process of digestion. Dr. Law urged, as an additional ground of preference for those natural and accidental experiments on the human subject, the reluctance of the British physician to experiment on inferior animals, except when impelled by imperious necessity,—a plea for which necessity, he felt, was only justifiable when these experiments held out a fair prospect of being directly instrumental to the attainment of a knowledge beneficial to mankind, and which could not be attained in any less objectionable way. The British physician participated in the sentiment of the distinguished Haller, who, when he would justify his experiments on animals, observes:—" *Multa ipse peri-*

cula feci, invisâ certe mihi crudelitate usus quam tamen utilitas humani generis et necessitas perinde excusant." Dr. Law, as a member of the Commission, hardly felt himself justified in entering into a discussion on the Report, which would necessarily involve technicalities scarcely suited to such a meeting, but would content himself by observing, that its chief topics were amongst some of the most interesting of physiology, and which had been proposed as subjects for investigation by the British Association, viz., "the sounds and motions of the heart." As Dr. Law had been a member of the Commission appointed by the British Association, it afforded him great satisfaction to find in the phenomena exhibited in M. Groux' case a confirmation of those results which had been deduced from the experiments then made, and had constituted the material of the Report. While Dr. Law subscribed to the Report on M. Groux' case, he had no difficulty in understanding why others should not do so. Discrepancies in observations when the senses of sight and hearing are simultaneously engaged, or even separately employed, seem not confined to physiology or medicine: astronomical observations exhibit similar discrepancies. Dr. Law felt that the interest evinced by the Academy towards the Report, and towards the few observations made upon it, would encourage future communications of the same nature.

Dr. Benson said he wished to make a few remarks in connexion with the subject of the Report, of which an abstract had just been read. He was not a member of the Committee, but he had been appointed, with Professors Jacob and Power, by the Council of the Surgical Society of Ireland to examine into the case of M. Groux, and report upon it. This Report he and his colleagues had made at a meeting of the Society, held in the College of Surgeons, on the 13th of March, and which was printed in the "Dublin Medical Press" of the 31st March. He (Dr. Benson) was very well pleased with the result of his investigations. They did not, indeed, bring to light anything very novel, nor establish any new facts; but they did what was better—they confirmed the opinions generally entertained respecting the actions and sounds of the heart. The opinions to which he alluded were those published by a Committee of the British Association after its first Meeting in Dublin, and founded upon experiments then made. He agreed with the authors of the Report, just now read, that the large, prominent, pulsating tumour in the fissure of M. Groux' sternum is the right auricle. It swells out suddenly as the concurrent effect of three causes:—1st, the influx of blood from the cavæ; 2nd, the reflux of blood from the right ventricle, or, at all events, the wave pushed back by the tricuspid valves; and, 3rd, the distention of the pulmonary artery behind it. He thought it very strange that distinguished men in London had differed so much as to the name to be given to this tumour,—one calling it the aorta, others the right ventricle,—while it seemed most obvious that the aorta could be felt (not seen) pulsating higher up, and the ventricle could be felt (not seen) pulsating lower down, all in the same fissure. M. Groux told him (Dr. Benson) that all the medical men who examined him in

Dublin agreed that the central prominent part above mentioned was the left auricle, which quite coincided with his (M. Groux's) own conviction. Dr. Lyons mentioned that Dr. Corrigan, a distinguished member of his Committee, had not signed the Report, not agreeing with the other members upon a point connected with the pulsation in that auricle. He (Dr. Benson) was inclined to think Dr. Corrigan's opinion was the correct one; but he would request Dr. Lyons to state that opinion again, as he was not sure that he had collected it accurately from the very short abstract of the Report read.

[Dr. Lyons explained.]

Dr. Benson resumed, and said that the opinions of the gentlemen who examined the case with him were very much divided. Two sounds were certainly heard when the stethoscope was pressed firmly back upon what he believed to be the origin of the pulmonary artery. All subscribed to that. But when the instrument was placed lightly on the auricle, sometimes one sound was heard, sometimes two, and sometimes none. One heard a splashing sound, another a rubbing, and so on. There was no agreement as to the number or character of the sounds; and, for his own part, he rather thought there was no sound, strictly speaking, produced in the auricle. The sounds which he sometimes heard might have depended on the friction of the skin against the instrument, or by the ripple caused by pressure, or they may have been conducted by the auricle from neighbouring parts.

He added, it was a curious fact that the sounds of the heart were better heard in most other individuals than in M. Groux: the sternum formed a kind of sounding-board, which rendered the sounds more audible in others; but the advantage in M. Groux's case was that they were more defined and localized.

Dr. Henry Kennedy said he had arrived at the conclusion that the tumour seen in the centre of the fissure could be none other than the right auricle, or a portion of it. He founded his opinion mainly on the anatomy of the heart itself; for no other cavity of the organ would admit of the same great and rapid dilatation which was seen when M. Groux pleased to render it prominent; but, besides what the sight took cognizance of, there was also sensible, to a gentle pressure, a very peculiar vermicular motion; and the auricle would exactly be, from its structure, the kind of cavity which would generate such a movement. From these arguments he felt satisfied that the central tumour was caused by the right auricle, and the phenomena present appeared to him to admit of no other explanation. He begged to state further his impression that in M. Groux's case the right heart was, most probably, above the natural size. Any one who had seen him exhibit could easily understand how this would be brought about. It was well known, too, that the pearl-divers were all short-lived, and this was due directly to affections of the right heart. In the present instance his opinion was founded on the very great distances which existed between the three centres of pulsation.

It was proposed by W. R. Wilde, Esq., and seconded by Geo. Petrie, LL. D., and passed unanimously,—

That the Report of the Commission be received by the Academy; and that the thanks of the Academy be given to the members of the Commission.

Sir W. R. Hamilton, LL. D., read a paper on a “New Method of Transformation of certain Diverging Series, with an Application to a Series connected with a celebrated definite Integral, which has important Physical Significations.”

The REV. PROFESSOR HAUGHTON made the following communication respecting—

NICOTINE CONSIDERED AS AN ANTIDOTE TO STRYCHNIA.

HAVING recalled to the recollection of the Academy the experiments he had communicated 29th November, 1856, on the poisoning of frogs by nicotine and strychnia, and the mutual counteraction of those poisons: Professor Haughton said he believed the subject to be an important one, as the action of the antidote depended on its physiological, and not on its chemical properties. After reading that paper, he had, in conjunction with Dr. H. Head, performed some experiments on dogs with those poisons, in January, 1857, but as they had not succeeded in recovering the animals from strychnia poisoning—in consequence of the nicotine acting as a powerful emetic, thus saving the animal's life, merely by emptying its stomach, as any other less dangerous emetic would have done—he had not published the results.

Quite recently, however, Mr. Haughton's experiments had proved to be the means of saving a human life, as was shown by the following case, published in the “Medical Times and Gazette” of the 12th inst.

“*Attempted Suicide with Strychnia; Treatment with Nicotine; Recovery.*—By THOMAS O'REILLY, M. D., M. R. C. S., ENG.—On Thursday, September 10, 1857, at 1 o'clock P.M., I was urgently requested by Dr. Byrne to accompany him to see a Mr. Johnson in this city (St. Louis, Missouri, U.S.), who, he was informed, had taken poison. On arrival at his residence we learned the following history to account for his condition:—

“After a three years' cruise as a musician on board an United States frigate, he was paid off in New York, and for the amount purchased drafts on St. Louis, which on his arrival here were found to be worthless. This, together with recent domestic sorrows, so overwhelmed him, that he determined on self-destruction. To accomplish this end, he called on a respectable druggist, and demanded a large dose of poison for a dog. The druggist gave him six grains of strychnia, which he carried into an adjoining beer-house, and, playfully remarking to the bar-tender that he was going on his last spree, mixed the strychnia with beer, and drank it off. Soon repenting this rash act, he mentioned to those present that he had taken poison, and wished they would give